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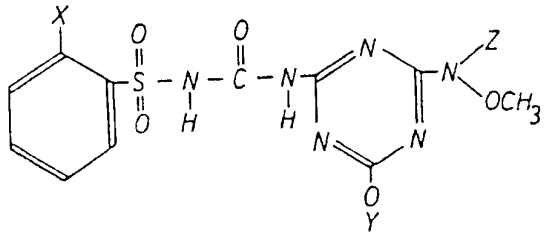
(54) **Herbicidal Trianzinyl aminocarbonyl-sulphonamides**

(57) Compounds of the formula:



wherein X is bromo, chloro or nitro
Y and Z are lower alkyl,
are useful as herbicides and as plant growth regulants.

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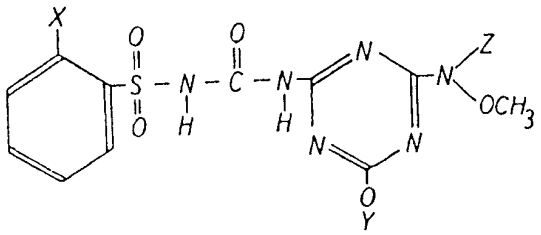
SPECIFICATION

Triazines

This invention relates to new chemical compounds of matter, their preparation and use as herbicides and plant growth regulants.

According to the present invention there are provided new triazine compounds of the formula:



(I)

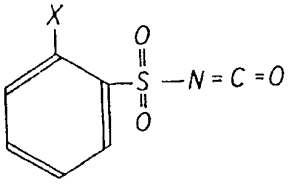
wherein X is bromo, chloro or nitro,

Y and Z independantly represent lower alkyl.

The term lower, as used herein, designates a straight or branched carbon chain of up to six carbon atoms.

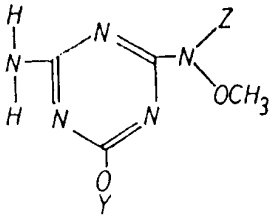
The compounds of the present invention are particularly useful as herbicides. In addition, they are useful as plant growth regulants for soybeans and wheat.

The compounds of the present invention can be prepared by reacting a compound of the formula:



(II)

with an equivalent amount of an amine of the formula:



(III)

This reaction can be effected by heating a mixture of the isocyanate and the amine in an inert reaction medium such as toluene with warming and stirring until the reactants dissolve. After this occurs, the product can be recovered by standard procedures for the removal of the solvent and can be further purified by standard procedures.

The invention will now be further described by reference to the following Examples.

EXAMPLE 1

Preparation of 2-Chloro-N-[6-(N-Methoxy-N-Methyl)Amino-4-Methoxy-1,3,5-Triazin-2-yl)Aminocarbonyl]Benzensulfonamide

2-Amino-4-Methoxy-6-(N-Methoxy-N-Methyl)Amino-1,3,5-Triazine (1.85 grams; 0.01 mol) and 2-[illegible] sulfonylisocyanate (2.2 grams; 0.01 mol) were combined in a glass reaction flask containing [illegible] Acetonitrile (25 ml) was added to the [illegible] temperature and filtered to give the product (1.7 grams) which melted at 181-183 C. Its elemental analysis was:

	C(%)	H(%)	N(%)
Theoretical:	38.76	3.75	20.86
Found:	38.45	3.73	21.17

EXAMPLE 2

Preparation of 2-Nitro-N-[6-(N-Methoxy-N-Methyl)Amino-4-Methoxy-1,3,5-Triazin-2-yl)Amino Carbonyl]-Benzenesulfonamide

2-Amino-4-Methoxy-6-(N-Methoxy-N-Methyl)Amino-1,3,5-Triazine (1.85 grams; 0.01 mol) and 2-Nitrobenzene-sulfonyl isocyanate (2.28 grams; 0.01 mol) were combined in a glass reaction flask equipped with a stirrer and containing dichloromethane (100 ml) under nitrogen. The reaction mixture was stirred overnight at room temperature. Analysis by thin layer chromatography showed the reaction was not complete so the reaction mixture was stirred a further twenty-four hours. Chromatographic analysis showed no change in the reaction so a small amount of the isocyanate was added to the reaction mixture. After five days, the dichloromethane was removed by distillation and the residue treated with boiling ethyl acetate (25 ml), cooled, and filtered to give a white solid. The solid was dried and analyzed by thin layer chromatography as being the desired product which has a melting point of 178-180°C and weighed 2.0 grams. Its elemental analysis was:

	C(%)	H(%)	N(%)
Theoretical:	37.77	3.66	23.72
Found:	37.83	3.76	23.51

EXAMPLE 3

Exemplary of the compounds within the scope of the present invention that can be prepared by the procedures of the preceding examples are:

2-bromo-N-[(6-(N-methoxy-N-methyl)amino-4-methoxy-1,3,5-triazine-2-yl)aminocarbonyl)benzenesulfonamide

2-nitro-N-[(6-(N-methoxy-N-isopropyl)amino-4-ethoxy-1,3,5-triazine-2-yl)aminocarbonyl)benzenesulfonamide

2-chloro-N-[(6-(N-methoxy-N-ethyl)amino-4-butoxy-1,3,5-triazine-2-yl)aminocarbonyl)benzenesulfonamide

2-bromo-N-[(6-(N-methoxy-N-hexyl)amino-4-pentoxy-1,3,5-triazine-2-yl)aminocarbonyl)benzenesulfonamide

For practical use as herbicides, the compounds of this invention are generally incorporated into herbecidal compositions which comprise an inert carrier and a herbicidally toxic amount of such a compound. Such herbicidal compostions, which can also be called formulations, enable the active compound to be applied conveniently to the site of the weed infestation in any desired quantity. These compositions can be solids such as dusts, granules or wettable powders; or they can be liquids such as solutions, aerosols or emulsifiable concentrates.

For example, dusts can be prepared by grinding and blending the active compound with a solid inert carrier such as the talc, clays, silicas, pyrophyllite and the like. Granular formulations can be prepared by impregnating the compound, usually dissolved in a suitable solvent, onto and into granulated carriers such as the attapulgites or the vermiculties, usually of a particle size range of from about 0.3 to 1.5 mm. Wettable powders which can be dispersed in water or oil to any desired concentration of the active compound can be prepared by incorporating wetting agents into concentrated dust compositions.

In some cases the active compounds are sufficiently soluble in common organic solvents such as kerosene or xylene so that theycan be used directly as solutions in these solvents. Frequently, solutions of herbicides can be dispersed under superatmospheric pressure as aerosols. However, preferred liquid herbicidal compositions are emulsifiable concentrates, which comprise an active compound according to this invention and as the inert carrier, a solvent and an emulsifier. Such emulsifiable concentrates can be extended with water and/or oil to any desired concentration of active compounds for application as sprays to the site of the weed infestation. The emulsifiers most commonly used in these concentrates are nonionic mixtures of nonionic with anionic surface-active agents. With the use of some emulsifier systems an inverted

EXAMPLE 4

Preparation of a dust

Product of Example 1	10
Powdered Talc	90

The above ingredients are mixed in a mechanical grinder-blender and are ground until a homogeneous, free-flowing dust of the desired particle size is obtained. This dust is suitable for direct application to the site of the weed infestation.

The compounds of this invention can be applied as herbicides in any manner recognized by the art. One method for the control of weeds comprises contacting the locus of said weeds with a herbicidal composition comprising an inert carrier and, as an essential active ingredient in a quantity which is herbicidally toxic to said weeds, a compound of the present invention. The concentration of the new compounds of this invention in the herbicidal compositions will vary greatly with the type of formulation and the purpose for which it is designed, but generally the herbicidal compositions will comprise from about 0.5 to about 95 percent by weight of the active compounds of this invention. In a preferred embodiment of this invention, the herbicidal compositions will comprise from about 5 to about 75 percent by weight of the active compound. The compositions can also comprise such additional substances as other pesticides, such as insecticides, nematocides, fungicides and the like; stabilizers, spreaders, deactivators, adhesives, stickers, fertilizers, activators, synergists and the like.

The compounds of the present invention are also useful when combined with other herbicides and/or defoliants, dessicants, growth inhibitors and the like in the herbicidal compositions heretobefore described. These other materials can comprise from about 5% to about 95% of the active ingredients in the herbicidal compositions. Use of combinations of these other herbicides and/or defoliants, dessicants, etc. with the compounds of the present invention provide herbicidal compositions of the individual herbicides. The other herbicides, defoliants, dessicants and the plant growth inhibitors, with which the compounds of this invention can be used in the herbicidal compositions to control weeds, can include chlorophenoxy herbicides such as 2,4-D, 2,4,5-T, MCPA, MCPB, 4(2,4-DB), 2,4-DEB, 4-CPB, 4-XPP, 2,4,5-TB, 2,4,5-TES, 3,4-DA, silvex and the like; carbamate herbicides such as IPC, CIPC, swep, barban, BCPC, CEPC, CPPC and the like; thiocarbamate and dithiocarbamate herbicides such as DCEC, methan sodium, EPTC, diallate, PEBC, perbulate, vernolate and the like; substituted urea herbicides such as norea, siduron, dichloral urea, chloroxuran, cycluron, fenuron, monuron, monuron TCA, diuron, linuron, monolinuron, neburon, buturon; trimeturon and the like; symmetrical triazine herbicides such as simazine, chlorazine, atrazine, desmetryne, norazine, ipazine, prometryn atrazine, trietazine, simetone, prometone, propazine, ametryne and the like; chloroacetamide herbicides such as alpha-chloro-N, n-dimethylacetamide, CDEA, CDAA, alpha-chloro-N-isopropylacetamide, 2-chloro-N-isopropyl-acetanilide, 4-(chloroacetyl)-morpholine, 1-(chloroacetyl)piperidine and the like; chlorinated aliphatic acid herbicides such as TCA, dalapon, 2,3-dichloropropropionic acid, 2,2,3-TPA and the like; chlorinated benzoic acid and phenylacetic acid herbicides such as 2,3,6-TBA, 2,3,5,6,-TBA, dicamba, tricamba, amiben, fenac, PBA fenac, PBA, 2-methoxy,3,6-dichlorophenylacetic acid, 3-methoxy-2,6-dichlorophenylacetic acid, 2-methoxy-3,4,6-trichlorophenylacetic acid, 2,4-dichloro-3-nitrobenzoic acid and the like; and such compounds as aminotriazole, maleic hydrazide, phenyl mercuric acetate, endothal, biuret, technical chlordane, dimethyl 2,3,5,6-tetrachloroterephthalate, diquat, erbon, DNC, DNBP, dichlorobenil, DPA, diphenamid, dipropalin, trifluralin, solan, dicryl, merphos, DMPA, DSMA, MSMA, potassium azide, acrolein, benefin, bensulide, AMS, bromacil, 2-(3,4-dichlorophenyl)-4-methyl-1,2,4-oxadiazolidine, 3,5-dione, bromoxynil, cacodylic acid, DMA, DPMF, cypromid, DCB, DCPA, dichlone, diphenatril, DMTT, DNAP, EBEP, EXD, HCA, iosynil, IPX, isocril, potassium cyanate, MAA, MAMA, MCPES, MCPP, MH, molinate, NPA, OCH paraquat, PCP, picloram, DPA, PCA, pyrichlor, sesone, terbacil, terbutol, TCBA, brominil, CP-50144, H-176-1, H-732, M-2091, planavin, sodium tetraborate, calcium cyanamid, DEF, ethyl xanthogen disulfide, sindone, sindone B, propanil and the like.

Such herbicides can also be used in the methods and composition of this invention in the form of their salts, esters, amides, and other derivatives whenever applicable to the particular patent compound.

Weeds are undesirable plants growing where they are not wanted, having no economic value, and interfering with the production of cultivated crops, with the growing of ornamental plants, or with the welfare of livestock. Many types of weeds are known, including annuals such as pigweed, lambsquarter, foxtail, crabgrass, wild mustard, field pennycress, ryegrass, goose grass, chickweed, wild oats, velvet leaf, purselane, barnyard grass, smartweeds, knotweed, cocklebur, wild buckwheat, kochia, medic corn cockle, ragweed, sowthistle, coffee-weed, croton, cupheah, dodder, fumitory, groundsel, hemp nettle, knowel, spurge, spurry, emex, jungle rice, pondweed, dog fennel, carpetweed, morning glory, bedstraw, ducksalad [illegible] wild barley, campion, chamomile, burdock, mullein, [illegible] grass, sheep sorrel, curly dock, nutgrass, field chickweed, dandelion, [illegible] knapweed, mewquite, toadflax, yarrow, aster, gromwell, horsetail, ironweed, sesbania, bulrush, cattail and

wintercress.

Similarly, such weeds can be classified as broadleaf or grassy weeds. It is economically desirable to control the growth of such weeds without damaging beneficial plants or livestock.

The new compounds of this invention are particularly valuable for weed control because they are toxic to many species and groups of weeds while they are relatively nontoxic to many beneficial plants. The exact amount of compound required will depend on a variety of factors, including the hardiness of the particular weed species, weather, type of soil, method of application, the kind of beneficial plants in the same area, and the like. Thus, while the application of up to only about one or two ounces of active compound per acre may be sufficient for good control of a light infestation of weeds growing under adverse conditions, the application of ten pounds or more of active compound per acre may be required for good control of a dense infestation of hardy perennial weeds growing under favourable conditions.

The herbicidal toxicity of the new compounds of this invention can be illustrated by many of the established testing techniques known to the art, such, as pre- and post-emergence testing.

EXAMPLE 5

The herbicidal activity of the compounds of this invention was demonstrated by experiments carried out for the pre-emergence control of a variety of weeds. In these experiments small plastic greenhouse pots filled with dry soil were seeded with the various weed seeds. Twenty-four hours or less after the seeding, the pots were sprayed with water until the soil was wet and the test compounds, formulated as aqueous emulsions of acetone solutions containing emulsifiers, were sprayed at the indicated concentrations on the surface of the soil.

After spraying, the soil containers were placed in the greenhouse and provided with supplementary heat as required and adequate watering. The plants were maintained under these conditions for a period of from 14 to 21 days, at which time the degrees of injury to the plants was rated on a scale of from 0 to 10 as follows: 0 = no injury; 1,2 = slight injury; 3,4 = moderate injury; 5,6 = moderately severe injury; 7,8,9 = severe injury and 10 = death. The effectiveness of these compounds is illustrated by the following data:

Pre-Emergence Herbicide Test Data

14 days after Treatment

Product of Example 1

Rate of Application (Lbs/Acre)	*1*	*0.5*	*0.25*	*0.125*
Wild Mustard	9	10	9	9
Bindweed	8	8	8	9
Pigweed	8	8	7	7
Velvet Leaf	10	NE	8	8
Morning Glory	8	6	6	6
Yellow Foxtail	8	7	8	6
Barnyard Grass	9	9	8	5
Johnson Grass	7	5	2	0
Quack Grass	NE	7	7	3
Wild Oats	5	2	2	0
Crabgrass	8	6	5	2
Sprangletop	7	5	5	0
Cheat Grass	8	7	8	6
Sugar Beet	7	7	6	6
Soybean	9	9	9	9
Cotton	9	7	5	5
Pinto Bean	7	6	7	2
Alfalfa	5	7	5	5
Wheat	6	3	0	0
Rice	9	9	8	5
Sorghum	9	9	6	5
Corn	9	9	9	9
Oats	4	4	2	0
Jimsonweed	5	5	0	–

Pre-Emergence Herbicide Test Data

21 Days after Treatment

Product of Example 1

Rate of Application (lbs/Acre)	*1*	*0.5*	*0.25*	*0.125*
Wild Mustard	9	10	9	9
Bindweed	8	8	8	9
Pigweed	8	8	7	6
Velvet Leaf	10	NE	9	9
Morning Glory	8	7	7	6
Yellow Foxtail	9	7	9	8
Barnyard Grass	9	9	8	5
Johnson Grass	7	5	0	0
Quack Grass	8	7	7	0
Wild Oats	5	0	0	0
Crabgrass	9	7	6	5
Sprangletop	8	0	0	0
Cheat Grass	8	8	9	7
Sugar Beet	8	8	7	7
Soybean	9	8	8	7
Cotton	9	7	5	5
Pinto Bean	7	7	7	2
Alfalfa	6	8	5	4
Wheat	2	0	0	0
Rice	9	8	9	2
Sorghum	9	9	7	7
Corn	10	10	9	9
Oats	3	3	2	0
Jimsonweed	8	7	3	–

Pre-Emergence Herbicide Test Data

14 Days after Treatment

Product of Example 2

Rate of Application (Lbs/Acre)	*8*	*4*	*2*	*1*	*0.5*	*0.25*
Wild Mustard	8	9	9	9	9	9
Bindweed	–	–	–	7	8	8
Pigweed	7	8	8	8	9	7
Velvet Leaf	8	7	7	8	NE	NE
Morning Glory	7	7	7	8	8	8
Yellow Foxtail	8	9	9	9	9	7
Barnyard Grass	9	9	9	9	9	9
Johnson Grass	8	9	8	7	8	7
Quack Grass	–	–	–	8	7	5
Wild Oats	7	7	6	5	6	5
Crabgrass	7	9	9	9	8	8
Sprangletop	–	–	–	8	9	7
Cheat Grass	NE	NE	NE	9	9	9
Sugar Beet	–	–	–	8	8	7
Soybean	–	–	–	9	9	9
Cotton	–	–	–	8	8	7
Pinto Bean	–	–	–	7	7	7
Alfalfa	–	–	–	4	5	5
Wheat	–	–	–	8	6	5
Rice	–	–	–	NE	9	NE
Sorghum	–	–	–	9	8	9
Corn	–	–	–	9	9	9
Oats	–	–	–	7	5	4
Jimson weed	6	8	8	8	5	NE
Yellow Nutsedge	NE	NE	NE	NE	–	–

Pre-Emergence Herbicide Test Data

14 Days after Treatment

Product of Example 2

Rate of Application (Lbs/Acre)	*0.125*	*0.062*	*0.031*	*0.015*
Wild Mustard	9	7	7	6
Bindweed	8	7	5	5
Pigweed	9	NE	NE	NE
Velvet Leaf	5	5	4	0
Morning Glory	8	5	4	2
Yellow Foxtail	4	1	0	0
Barnyard Grass	8	6	4	3
Johnson Grass	5	NE	1	0
Quack Grass	5	3	0	0
Wild Oats	3	3	1	0
Crabgrass	7	4	4	0
Sprangletop	4	–	–	–
Cheat Grass	8	8	7	5
Sugar Beet	8	3	3	3
Soybean	9	7	6	3
Cotton	5	3	3	2
Pinto Bean	5	4	4	4
Alfalfa	5	5	4	5
Wheat	2	1	0	0
Rice	9	6	7	0
Sorghum	8	5	5	2
Corn	9	5	4	1
Oats	4	4	3	7
Jimsonweed	5	4	4	NE
Yellow Nutsedge	5	2	1	0

Pre-Emergence Herbicide Test Data

21 Days after Treatment

Product of Example 2

Rate of Application (Lbs/Acre)	*8*	*4*	*2*	*1*	*0.5*	*0.25*
Wild Mustard	7	10	10	10	9	9
Bindweed	–	–	–	8	8	7
Pigweed	6	9	9	7	7	7
Velvet Leaf	7	8	8	8	NE	NE
Morning Glory	5	7	7	8	8	8
Yellow Foxtail	7	9	9	9	9	9
Barnyard Grass	9	10	10	9	9	9
Johnson Grass	7	9	9	8	8	7
Quack Grass	–	–	–	9	8	7
Wild Oats	5	8	7	7	6	7
Crabgrass	6	9	9	9	9	9
Sprangletop	–	–	–	9	10	8
Cheat Grass	NE	NE	NE	9	9	9
Sugar Beet	–	–	–	8	8	7
Soybean	–	–	–	9	9	9
Cotton	–	–	–	8	8	8
Pinto Bean	–	–	–	7	7	7
Alfalfa	–	–	–	9	7	7
Wheat	–	–	–	8	3	2
Rice	–	–	–	8	9	NE
Sorghum	–	–	–	10	9	9
Corn	–	–	–	10	10	10
Oats	–	–	–	8	6	6
Jimsonweed	7	9	9	9	8	NE
Yellow Nutsedge	NE	NE	NE	NE	–	–

Pre-Emergence Herbicide Test Data

21 Days after Treatment

Product of Example 2

Rate of Application (Lbs/Acre)	*0.125*	*0.062*	*0.031*	*0.015*
Wild Mustard	9	9	8	3
Bindweed	7	NE	3	3
Pigweed	8	NE	NE	NE
Velvet Leaf	5	4	2	1
Morning Glory	7	6	5	3
Yellow Foxtail	8	6	3	1
Barnyard Grass	8	7	5	4
Johnson Grass	6	NE	4	2
Quack Grass	7	4	3	0
Wild Oats	7	4	3	2
Crabgrass	8	4	3	0
Sprangletop	3	–	–	–
Cheat Grass	9	10	6	6
Sugar Beet	7	7	6	6
Soybean	9	7	5	4
Cotton	7	3	3	0
Pinto Bean	6	6	5	4
Alfalfa	7	7	4	4
Wheat	2	5	5	3
Rice	10	7	7	3
Sorghum	9	6	5	3
Corn	10	6	5	4
Oats	6	6	5	10
Jimsonweed	7	4	5	NE
Yellow Nutsedge	6	2	0	0

The [illegible] was also demonstrated by experiments carried [illegible] species that have attained a prescribed size [illegible] and watered daily or more frequently. Water was not applied to the foliage of the treated plants. The severity

of the injury was determined 14 days after treatment and was rated on the scale of from 0 to 10 as previously defined. The effectiveness of these compounds is illustrated by the following data:

Post-Emergence Herbicide Test Data

Product of Example 2

Rate of Application (Lbs/Acre)	*4*	*2*	*1**	*0.5**	*0.25**	*0.125***
Wild Mustard	10	7	9	10	10	9
Bindweed	8	6	3	7	5	5
Pigweed	8	8	9	9	7	7
Velvet Leaf	–	–	7	8	8	6
Morning Glory	10	6	8	8	7	5
Yellow Foxtail	10	10	9	8	7	7
Barnyard Grass	8	10	8	9	9	8
Johnson Grass	9	9	9	7	7	6
Quack Grass	–	–	9	8	7	6
Wild Oats	5	4	7	5	5	4
Crabgrass	8	4	6	6	4	2
Sprangletop	–	–	8	8	6	2
Cheat grass	–	–	7	7	7	6
Sugar Beet	–	–	9	8	10	10
Soybean	8	8	8	8	8	9
Cotton	–	–	7	5	5	1
Pinto Bean	–	–	6	5	5	1
Alfalfa	–	–	8	8	9	8
Wheat	–	–	5	4	4	2
Rice	–	–	6	6	6	6
Sorghum	–	–	7	6	6	4
Corn	–	–	8	9	8	6
Oats	–	–	7	7	6	5
Jimson weed	10	8	7	–	–	–

** Average of 3 Replicates

Post-Emergence Herbicide Test Data

14 Days After Treatment

Product of Example 1

Rate of Application (Lbs/Acre)	*1.0*	*0.5*	*0.25*	*0.125*
Wild Mustard	10	10	10	10
Bindweed	10	6	7	5
Pigweed	9	6	7	10
Velvet Leaf	10	10	9	7
Morning Glory	8	8	9	6
Yellow Foxtail	8	8	7	8
Barnyard Grass	10	10	9	8
Johnson Grass	5	5	0	0
Quack Grass	10	10	2	0
Wild Oats	7	7	2	2
Crabgrass	3	3	0	0
Sprangletop	5	2	0	0
Cheat Grass	5	5	0	0
Sugar Beet	10	10	10	10
Soybean	9	9	9	9
Cotton	7	7	0	0
Pinto Bean	5	5	4	4
Alfalfa	10	9	7	10
Wheat	1	1	0	0
Rice	4	4	2	0
Sorghum	7	7	7	6
Corn	9	8	5	5
Oats	6	6	2	0
Jimsonweed	9	9	8	7

In addition to their utility as herbicides, the compounds of this invention also have utility as plant growth co regulants for soybeans. Due to the acreage of soybean production, this is a significant utility. Plant growth [illegible] the leaves of the soybean plants with a soybean regulating [illegible] that need be applied to the soybean plants depends on [illegible] Normally, amounts of from about 0.0[illegible] method of application, the presence of other plants in the area, etc.

to about one pound per acre can give the desired regulatory effect, although in certain instances more or less can be applied with satisfactory results.

EXAMPLE 5

In order to determine the plant growth regulant characteristics of the disclosed compounds, the pre- and post-emergence testing procedures previously described were repeated with soybean plants and the compound of Example 2 as the test compound. Four rates of application were used: i.e., 0.125, 0.062, 0.031 and 0.015 pounds per acre.

Post-Emergence Testing

Rate of Application (Pounds Per Acre)	*Biological Symptom*	*34 Days After Treatment*		*52 Days After Treatment*	
		Test 1	*Test 2*	*Test 1*	*Test 2*
0.125	Necrosis	0	0	0	0
	Stunting	9	9	3	9
	Formative Effects	7	0	3	0
0.062	Necrosis	0	0	0	0
	Stunting	5	8	0	2
	Formative Effects	3	7	1	2
0.031	Necrosis	0	0	0	0
	Stunting	3	5	2	5
	Formative Effects	2	3	2	2
0.015	Necrosis	0	0	0	0
	Stunting	0	1	0	0
	Formative Effects	1	2	0	4

Testing showed major inhibition of apical meristem development. Other symptoms shown by the testing were significant axillary bud break, distortion of leaflet shape and reduction in leaflet size. Below 0.125 pounds per acre, the bulk of the soybean shoot is represented as branches that have developed from the axillary buds of the unfoliate leaves.

Pre-Emergence Testing

Rate of Application (Pounds per Acre)	*Biological Symptom*	*34 Days After Treatment Test 1*	*Test 2*	*52 Days After Treatment Test 1*	*Test 2*
0.125	Necrosis	0	0	0	0
	Stunting	8	NE	8	NE
	Formative Effects	3	0	7	0
0.062	Necrosis	0	0	0	0
	Stunting	5	5	3	5
	Formative Effects	2	3	2	1
0.031	Necrosis	0	0	0	0
	Stunting	3	2	2	2
	Formative Effects	2	1	1	1
0.015	Necrosis	0	0	0	0
	Stunting	3	1	2	0
	Formative Effects	2	0	1	0

In addition, the leaflet shape is modified.

The pre-emergence testing procedures were repeated on soybean plants using the compound of Example 2 with the following results:

Application Rate (Pounds Per Acre)	Biological Symptom	14 Days After Treatment	21 Days after Treatment
1	Necrosis	0	3
	Stunting	7	7
	Formative Effects	5	4
	Chlorosis	4	0
0.5	Necrosis	0	0
	Stunting	7	7
	Formative Effects	5	4
	Chlorosis	4	4
0.25	Necrosis	0	0
	Stunting	7	7
	Formative Effects	4	4
	Chlorosis	4	4
0.125	Necrosis	0	0
	Stunting	7	7
	Formative Effects	5	4
	Chlorosis	4	4

In addition, the soybean plants showed axillary bud breaks.

In another test of the plant growth regulant characteristics of the present compounds, the compound of Example 2 was applied to the lower soil zone of a two-soil layer, nested cup test unit, soybeans were planted in the upper soil layer which permits the penetration of the roots into the lower soil zone. Test units were incubated in the dark at 61°C for six days with the following results. In the ratings, 0 = no effect and 10 = either no root penetration of lower soil zone or no shoot emergence of upper soil zone.

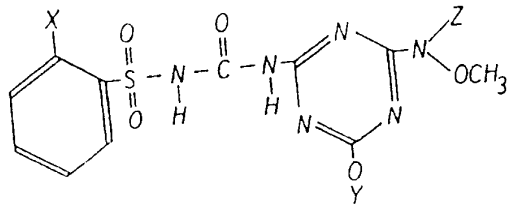
Application Rate Mg/Unit	Soybean Root	Shoot
1.0	7	0
0.2	6	0
0.04	5	0
0.008	5	0
0.0016	0	0
0.00032	5	0
0.000064	6	0
0.0000128	5	0

This two-soil layer system was used in an additional test of the plant growth regulant characteristics of the present compounds. In this test, the compound of Example 2 was applied to the lower soil layer and to the upper soil layer.

Application Rate Mg/Unit	or Pounds/Acre	Soybean Application To Lower Root	Soybean Application To Lower Shoot	Soybean Application To Upper Soil Root	Soybean Application To Upper Soil Shoot
5.0	2.819	10	8	10	9
1.0	0.564	5	2	10	10
0.2	0.113	7	2	9	4
0.04	0.0225	2	2	10	10
0.008	0.0045	5	1	10	9
0.0016	0.0009	0	0	3	5

CLAIMS

1. A compound of the formula:



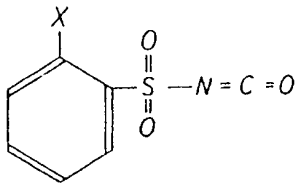
2. 2-nitro-N-[6-(N-methoxy-N-methyl[illegible]
benzenesulfonamide.

3. 2-chloro-N-[6-(N-methoxy-N-methyl)amino-4-methoxy-1,3,5-triazin-2-yl-aminocarbonyl]-benzenesulfonamide.

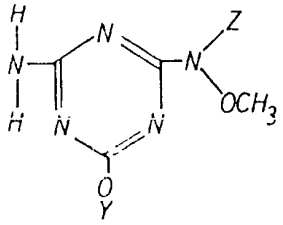
4. 2-bromo-N-[6-(N-methoxy-N-methyl)amino-4-methoxy-1,3,5-triazin-2-yl aminocarbonyl]-benzenesulfonamide.

5. A compound as claimed in claim 1 substantially as hereinbefore described in Example 1, 2 or 3.

6. A method of preparing a compound of the general formula defined in claim 1 which comprises reacting a compound of the formula



wherein X is bromo, chloro or nitro,
with an equivalent amount of an amine of the formula



wherein Y and Z independantly represent lower alkyl.

7. A method as claimed in claim 6, substantially as hereinbefore described in Example 1, 2 or 3.

8. A herbicidal composition comprising an inert carrier and, as an essential ingredient in a quantity toxic to weeds, a compound as claimed in any one of claims 1 to 5.

9. A herbicidal composition substantially as hereinbefore described in Example 4 or 5.

10. A method of controlling weeds which comprises contacting said weeds with a compound as claimed in any one of claims 1 to 5 or a herbicidal composition as claimed in claim 8 or 9.

11. A method of regulating the growth of soybeans which comprises applying a regulating amount of a compound as claimed in any one of claims 1 to 5 to the soybeans.

12. A method of controlling weeds substantially as hereinbefore described in Example 5.

13. A method of regulating the growth of soybeans substantially as hereinbefore described in Example 5.

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